

Chapter 11

Intelligent Decision Making and Risk Analysis for IT Management Processes

Masoud Mohammadian
University of Canberra, Australia

Ric Jentzsch
University of Canberra, Australia

EXECUTIVE SUMMARY

IT management processes have been growing as the development of modern IT systems has grown. These are often complex with multiple interdependencies that can make it very difficult for Chief Information Officers (CIOs) to comprehend and be aware of potential risks. These risks have the potential to translate into decision making inefficiencies for an organization. Risk analysis for decision making in the planning and monitoring of these systems can be a complex and demanding task. Intelligent decision making in IT management processes and systems are a crucial element of an organization's success and its competitive position in the marketplace. This chapter considers the implementation of Fuzzy Cognitive Maps (FCM) to provide facilities to capture and represent complex relationships in an IT management process model. By using FCMs, CIOs can regularly review and improve their IT management processes and provide greater improvement in development, monitoring and maintenance of those processes. CIOs can perform what-if analysis to better understand vulnerabilities of their designed system.

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INTRODUCTION

Decision making can proceed by informal deliberation or with the help of an analytical technique of different types (Van Gelder, 2010). Deliberation is the careful consideration of options and related issues expressed as relevant arguments and evidence (Van Gelder, 2010). Everyone has and uses informal deliberation in some type of decision making process, which may be habitual, unconscious, or by default. The informal process is automatically adopted when no other decision making process has been selected (Van Gelder, 2010). With deliberation in decision making comes risk.

There is an urgent need to improve decision making in IT management. Informal decision making methods can be unreliable, and can lead to bad decisions (where the wrong choice was made), based on thinking that was clearly ill-informed, sloppy, disorganised, incomplete or biased (Van Gelder, 2010). Analytical techniques for decision making, though employing a disciplined and systematic approach, can partly be developed to overcome the unreliability of informal methods (Van Gelder, 2010). However even these are not exempt from the possibility of establishing bad decisions.

Decision making in the real world is frequently dynamic and often constrained by limited or restricted resources. Real world decision situations exist in the context of systems, which are usually characterised by a number of interacting concepts that evolve over time (Salmeron, 2009). Any support to helping the decision makers reduce the risk of incorrect decisions will provide long term benefits to an organization. To do this, decision makers need to construct a representation of the decision problem, establish alternative courses of action, and imagine or calculate the outcome of choosing an alternative (Salmeron, 2009). This chapter provides just such a model in analysing IT management processes and developing a risk analysis based on using FCM with the model.

INFORMATION TECHNOLOGY PROCESSES

IT processes are activities for development and maintenance of applications, supporting infrastructure (e.g., hardware, systems software, and networks), to managing human resources. Luftman, Bullen et al., (2004) described 38 IT processes that cover all aspects of IT management in an organization. These IT processes have been categorized in three main layers. These layers include:

1. Strategic - focus is on long-term goals, for SME's that is approximately 3 to 4 years, while for large enterprises it is ≥ 4 years;

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